Amendments to the Drawings

Figure 1 is amended to designate it as Prior Art.

Remarks

Claims 1-10 are pending in the application. Claims 1-10 are rejected. The Claims are not amended. All rejections are respectfully traversed.

Figure 1 is amended to designate it as Prior Art. A Replacement Sheet for Figure 1 is included with this response.

2. Claims 1-6, and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al. (US 7,096,034, Hereinafter, Zhang).

The present application distinguishes Zhang at paragraph [018], which is now U.S. Patent 7,096,034.

[018] U.S. Patent Application 20030064744 by Zhang et al. April 3, 2003 describes a method for reducing power consumption in mobile devices. Their power allocation method maximizes a total effective data rate in the channel.

Zhang is only interested in minimizing power while maximizing the effective transmission rate, see Abstract:

"The base station sets a target signal quality value for each mobile station, and the target values are determined by the base station such that the total effective data rate from all the mobile devices is maximized under constraints of the total received power and the error protection level requirements for the mobile devices."

The invention *measures a condition of the channel*. The Examiner states that Zhang shows measuring a condition of the channel at col. 7, lines 6-10. With all due respect, this is incorrect.

At column 7, Zhang only states what the channel is, *i.e.*, "good" or "bad." There is no measuring of the channel, see below:

> adaptive to the input source signals but also to the dynamic wireless channel conditions. For example, when the wireless channel is in a "good" condition (i.e., the channel is stable and less noisy, and the error rate is low and signal-interference ratio is high), the source encoder may introduce large transmission rate, and the channel encoder may use less

Zhang cannot anticipate what is claimed.

The invention *measures rate and distortion characteristics of the multimedia.* The Examiner states that Zhang measures a rate of the multimedia at col. 7, lines 10:

> transmission rate, and the channel encoder may use less protection symbols. On the other hand, in a case when the

There is nothing there about measuring the multimedia.

The Examiner cites col.9 line 62 as measuring the distortion of the multimedia:

> tion is characterized by Bit Error Rate b. The QoS requirement for each mobile device is described by the base station as a SIR lower limit γ', and at each mobile device it is represented by total tolerable distortion D_0. The resource

This sentence only states that the QoS requirement at each mobile device is represented by D_o. There is nothing there that would suggest that Zhang measures the rate and distortion of multimedia.

> the mobile devices. Accordingly, the base station and the mobile devices are configured for H.26L protocol, and preferably employ a bit allocation algorithm for available bits distribution. In particular, at mobile devices, the source

Because the mobile devices are configured for the H.26L protocol does not imply measuring characteristics of multimedia.

Based on this limitation of measuring the characteristics of multimedia alone, Zhang cannot anticipate the invention.

The invention provides a set of error resilient source encoding procedures.

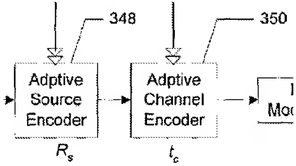
At column 7, Zhang states that the pilot signal indicates an error protection level.

> mobile device first registers with the base station it sends pilot information **372** (FIG. **3**) to the base station. The pilot information includes the error protection level requested by the mobile device. The mobile device also sends pilot

Indicating an error level is not the claimed providing a set of error resilient source encoding procedure. In wireless communication, those of ordinary skill in the art know that source encoding is used for data compression, and channel encoding is used for error protection. The desirable level of error protection in Zhan would be attained by the channel encoder 350 of Zhang, and not a set of source encoding procedures. With all due respect, the Examiner seems to have confused the purpose of the source encoding 348 (compression) and the channel encoding 350 (error protection), see Figure 3 of Zhang.

In any case, Zhang only has a *single* source encoder 348, “source encoder 348 encodes the input signals to form source-coded data.” “The source

encoder 348 is responsible for encoding input source signals, such as, images, video/audio signals, and text signals, to appropriately *remove a portion of redundant signals* (please read as compression) in source signals, and generating an output source encoded signal."



Relating error protection at column 7, lines 56-57 to the source encoder, as the Examiner has done, with all due respect, is incorrect. Error protection is achieved by a channel encoder.

It is clear from column 7 of Zhang that there is only one channel encoder.

> The source and channel encoders are preferably not only adaptive to the input source signals but also to the dynamic wireless channel conditions. For example, when the wireless channel is in a "good" condition (i.e., the channel is stable and less noisy, and the error rate is low and signal-interference ratio is high), the source encoder may introduce large transmission rate, and the channel encoder may use less protection symbols. On the other hand, in a case when the wireless channel is in a "bad" condition, the channel encoder may apply more protection to the data. This change of error protection causes the mobile device to send a pilot information packet 372 to the base station

Based on this limitation alone, Zhang cannot anticipate what is claimed.

At column 10, Zhang minimizes a *total* power level.

$$\min_{\{P_t, R_s, R_c, \eta\}} P_{total}(P_s(R_s) + P_c(R_c) + P_{trans}(P_t(\epsilon_b, R_s + R_c)))$$

Zhang defines the total power at column 10, line 10:

coefficient η. Therefore, the total power consumption at mobile device may be expressed as:

$$P_{total} = P_s + P_c + P_{trans} \quad \text{(Equation 1)}$$

A minimum power level is always a single power level, and never a set of transmitter power levels.

Claimed is providing a set of *transmitter* power levels (the third term in equation (1). Zhang does not anticipate this limitation.

The invention provides an objective function and a constraint based on energy and distortion. At column 9, lines-61-62, Zhang describes:

ment for each mobile device is described by the base station as a SIR lower limit γ^t, and at each mobile device it is represented by total tolerable distortion D_0. The resource

and at column 10

the energy for transmitting a bit ϵ_b and the transmission rate R_{trans} which is summation of the source and channel coding

There is no objective function, and a constraint based on energy and distortion at either paragraphs.

First, Zhang does not measuring a condition of the channel and a rate and distortion characteristics of the multimedia. Zhang does not provide a set of

error resilient source encoding procedures, a set of channel encoding procedures, a set of transmitter power levels, an objective function and a constraint based on energy and distortion. Therefore, Zhang cannot select jointly a particular error resilient source encoding procedure, a particular channel encoding procedure, and a particular power level based on the condition of the channel and the rate and distortion characteristics, while minimizing an objective function and satisfying a constraint.

As stated above, error protection is not determined by source encoding, see column 7, lines 56-57.

None of the following paragraphs have anything to do with selecting anything:

> The source and channel encoders are preferably not only adaptive to the input source signals but also to the dynamic wireless channel conditions. For example, when the wireless channel is in a "good" condition (i.e., the channel is stable

> rates. Then the minimization of the total power consumption problem may be expressed as:

> ment for each mobile device is described by the base station as a SIR lower limit γ', and at each mobile device it is represented by total tolerable distortion D_0. The resource

> therefore, operational parameters are covariant.
>
> The operational state of the mobile system is adaptively set according to the wireless channel condition, QoS requirements, and resource limitations. The channel condition is characterized by Bit Error Rate b. The QoS require-

From the above, it is clear that Zhang does not describe or show a single limitation of what is claimed. Therefore, Zhang cannot anticipate the invention.

As per claim 2, Zhang does not describe the claimed objective function.

> therefore, operational parameters are covariant.
>
> The operational state of the mobile system is adaptively set according to the wireless channel condition, QoS requirements, and resource limitations. The channel condi-

As per claim 3, energy is not described in Zhang. Note, energy is the capacity for work measured in Joules and power is the rate of doing work measured in Watts.

As per claim 4, see above regarding confusion over source and channel coding.

As per claim 5, a layered bitstream as know in the art typically includes a base layer and one or more enhancement layers. There is nothing like that at:

> mobile device first registers with the base station it sends pilot information **372** (FIG. **3**) to the base station. The pilot information includes the error protection level requested by the mobile device. The mobile device also sends pilot

As per claim 6, there is no bandwidth described at column 9:

> requirements, and resource limitations. The channel condition is characterized by Bit Error Rate b. The QoS requirement for each mobile device is described by the base station

As per claim 10, see above.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al. (US 7,096,034, Hereinafter, Zhang) in view of Wee et al. (US 7,054,335, D.Z Hereinafter, Wee).

As per claim 7, Zhang and Wee in combination do not describe measuring rate and distortion characteristics of JPEG2000 multimedia.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al. (US 7,096,034, Hereinafter, Zhang) in view of Wang et al. (US 2005/0002337, Hereinafter, Wang).

As per claim 8, Zhang and Wang in combination do not describe measuring rate and distortion characteristics of moving JPEG2000 multimedia.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al. (US 7,096,034, Hereinafter, Zhang) in view of Xu et al. (US 2005/0094731, Hereinafter, Xu).

As per claim 9, Xu describes a rate-distortion curve:

> [0104] **FIG. 12** shows an optimal bitstream truncation and construction procedure **1200**, which may be implemented by the entropy coder **132** of the video encoder **124** (**FIG. 1**). At block **1202**, the entropy coder truncates each sub-band bitstream using rate distortion optimization. Given a specific bit-rate R_{max}, a bitstream can be constructed that satisfies the bit-rate constraint and with minimal distortion. One candidate truncation point is the end of each entropy coding pass. At the end of each pass, the bit length and the distortion reduction is calculated and a value for each candidate truncation point can be plotted to produce an approximate R-D (rate-distortion) curve.

As per claim 10, claimed is an minimizing an function and satisfying a constraint by analyzing an energy-distortion curve.

It is believed that this application is now in condition for allowance. A notice to this effect is respectfully requested. Should further questions arise concerning this application, the Examiner is invited to call Applicants' attorney at the number listed below. Please charge any shortage in fees due in connection with the filing of this paper to Deposit Account 50-0749.

Respectfully submitted,
Mitsubishi Electric Research Laboratories, Inc.

By
/Dirk Brinkman/

Dirk Brinkman
Attorney for the Assignee
Reg. No. 35,460

201 Broadway, 8th Floor
Cambridge, MA 02139
Telephone: (617) 621-7517
Customer No. 022199